

**NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Washington, D.C. 20594

June 27, 2005

**Meteorology**

**Meteorological Factual Report  
by James T. Skeen, Jr.**

**A. INCIDENT**

Location: Atlantic Ocean  
Date: April 16, 2005  
Time: 0615 Eastern Daylight Time  
Vessel: M/V Norwegian Dawn  
NTSB Number: DCA05MM018

**B. GROUP**

Chairman: James T. Skeen, Jr.  
Senior Meteorologist  
National Transportation Safety Board  
Washington, D.C.

Member: None

## C. SUMMARY

On April 16, 2005, at 0615 eastern daylight time (EDT), the 965-foot cruise ship *Norwegian Dawn* encountered rough seas and significant waves about 160 nautical miles east of Charleston, South Carolina. Several passengers reported minor injuries, and the vessel diverted to Charleston for repairs.

The Meteorological Group Chairman did not participate in the on-scene investigation.

## D. DETAILS OF INVESTIGATION

Notes: Unless noted, in the report all times are EDT based on the 24-hour clock. Coordinated Universal Time (UTC) = EDT + 4 hours. UTC = Z.

### 1. Synoptic Situation

Figures 1, 2, 3, 4, and 5 shows portions of the Surface Analysis charts prepared by the National Weather Service (NWS) National Centers for Environmental Prediction (NCEP) for 0800, 1400, and 2000 April 15 and 0200 and 0800 April 16, respectively. Notes: The charts were obtained from the NWS NCEP Internet site. The approximate incident location was annotated on the charts.

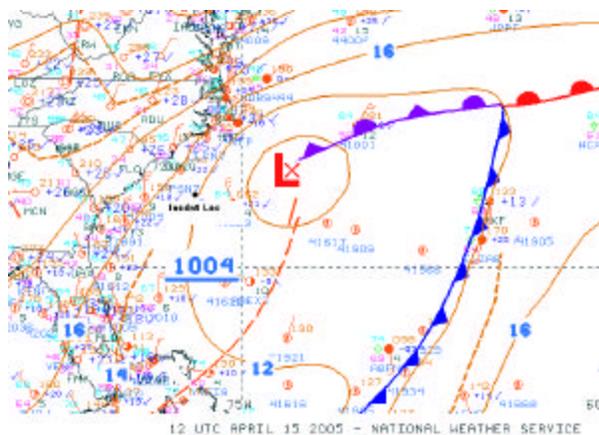


Figure 1. Surface chart for 0800 EDT April 15

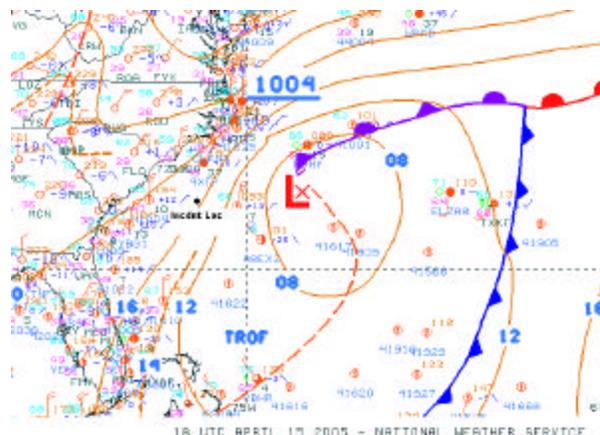


Figure 2. Surface chart for 1400 EDT April 15

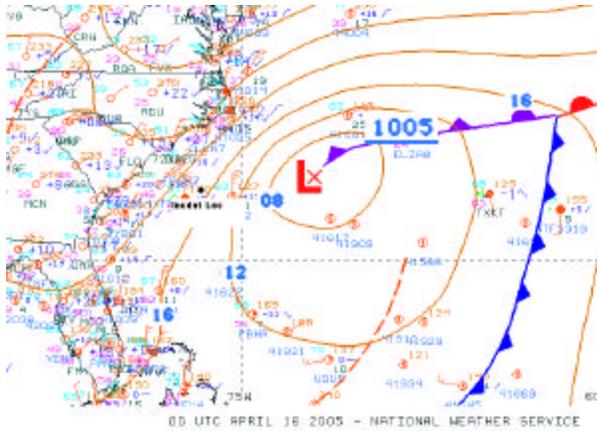


Figure 3. Surface chart for 2000 EDT April 15

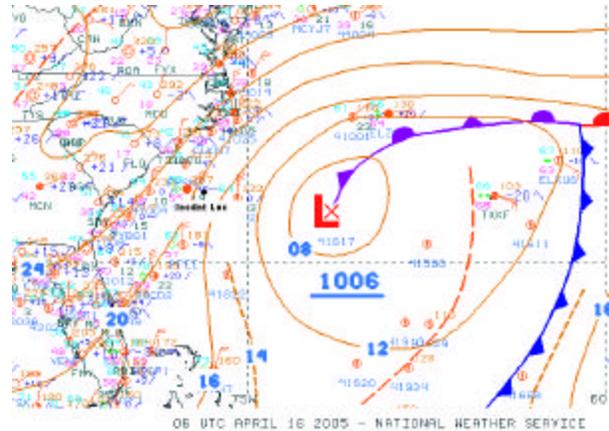


Figure 4. Surface chart for 0200 EDT April 16

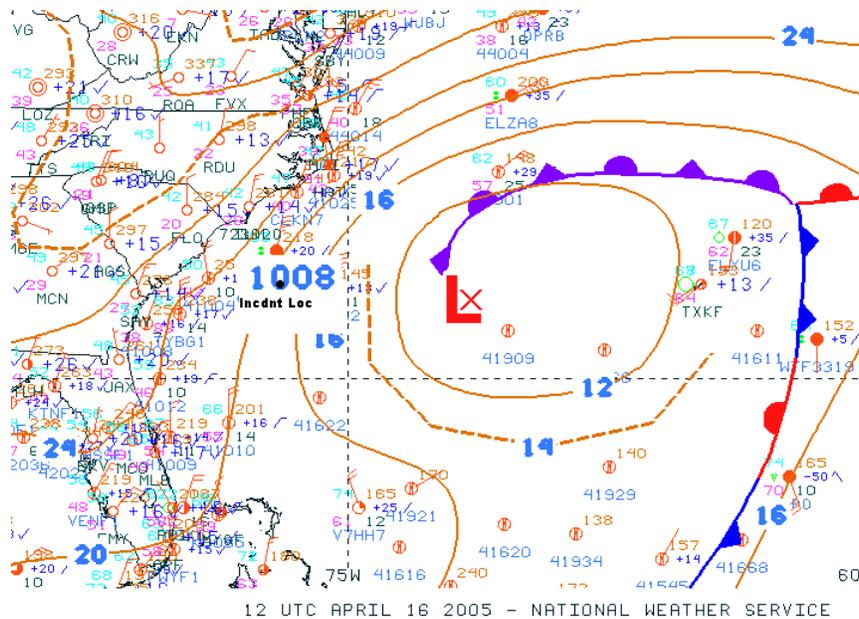


Figure 5. Surface chart for 0800 EDT April 16

## 2. Satellite Wind Analysis

Figure 6 shows QuikSCAT satellite-derived wind data centered on the southwestern Atlantic Ocean. The wind plots were taken from the QuikSCAT ascending path at the nominal time of 1058 UTC (0658) April 16. Notes: The SeaWinds instrument on the QuikSCAT satellite is a specialized radar that measures near-surface wind speed and direction at a 25-kilometer resolution. Data may be contaminated by rain in the incident area. The approximate incident location is annotated by •.

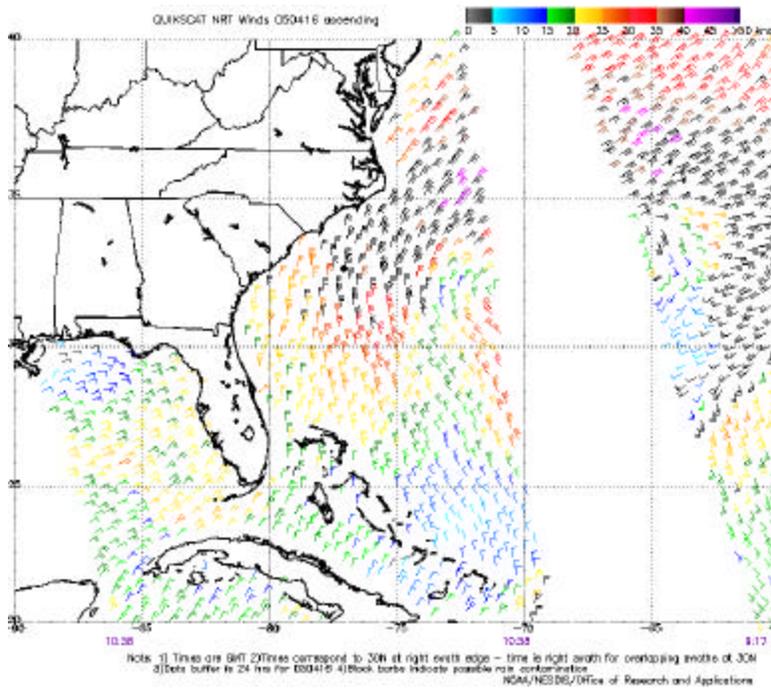


Figure 6. QuikSCAT winds for 0658 EDT April 16

### 3. Gulf Stream Analysis

Figure 7 shows the Oceanographic Features Analysis prepared by the Naval Oceanographic Office at Bay St. Louis, Mississippi, for April 18. Note: The approximate incident location is annotated by ●.

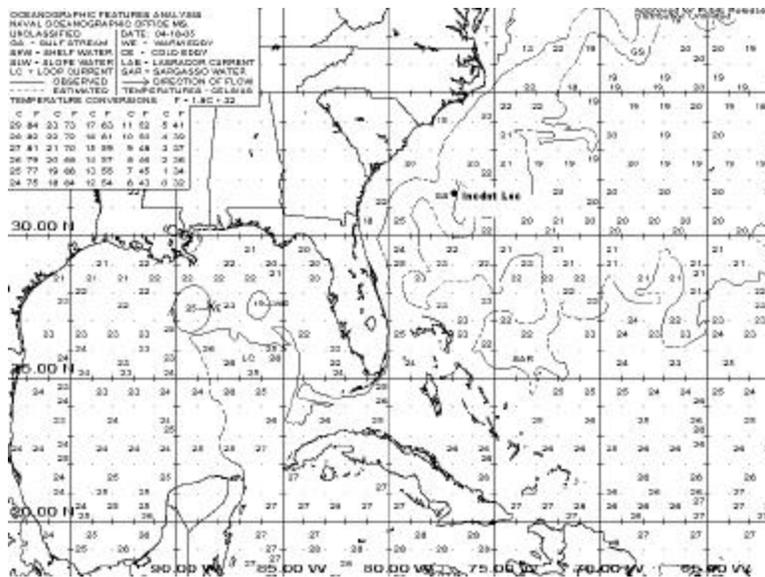


Figure 7. Oceanographic Features chart for April 18

#### 4. GOES-12 (Geostationary Operational Environmental Satellite-12) Data

GOES-12 visible and infrared digital data centered on the accident location were obtained through the NOAA's Comprehensive Large Array-data Stewardship System (CLASS) and displayed on a NTSB McIDAS<sup>1</sup> workstation. Notes: Nominal resolutions of the visible and infrared data are 1 and 4 kilometers, respectively. Visible data are useable due to darkness.

Figure 8 shows an infrared image centered on the accident location for the nominal time of 0615 (1015 UTC). The image is remapped to the Mercator projection and X 2 magnified.

Notes: A map background, marine forecast zones, and the incident location are overlaid on the image. The thunderstorm color enhancement curve MB1 is applied to the infrared data. A color bar showing equivalent radiative temperatures (degrees Kelvin) is depicted on the right side of the infrared image.

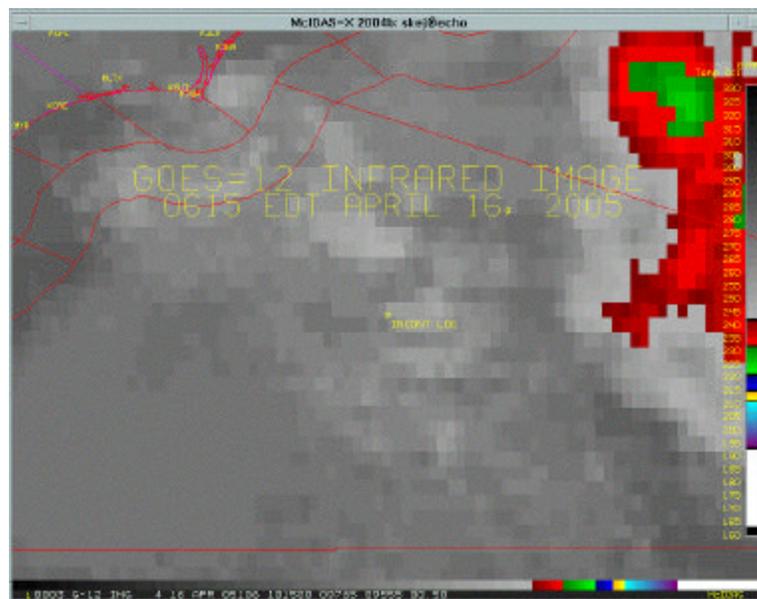


Figure 8. GOES-12 infrared image for 0615 EDT April 16

#### 5. National Weather Service WS-88D Data

The Wilmington (KLTX), North Carolina, Weather Surveillance Radar-1988, Doppler (WSR-88D) radar was the closest Doppler weather radar (approximately 321 degrees at 118 nautical miles from the incident location). Assuming standard refraction<sup>2</sup>, the KLTX radar beam was centered over

<sup>1</sup> McIDAS is a meteorological and data analyses computer-based system developed by the Space Science and Engineering Center (SSEC) at the University of Wisconsin at Madison, Wisconsin.

<sup>2</sup> Refraction in the atmosphere when temperature and humidity distributions are approximately average.

the incident location at approximately 15,600 feet msl for the lowest antenna elevation angle of 0.5-degree.

Figure 9 displays the KLTX Archive Level III<sup>3</sup> Base Reflectivity product for the 0.5-degree elevation scan for the nominal time of 0612:23.

Notes: The Level III data were obtained from the National Climatic Data Center (NCDC) Hierarchical Data Storage System (HDSS) and displayed using the NCDC Java NEXRAD Viewer. A map background and the incident location are overlaid on the product. A color bar depicting possible radar reflectivity intensities is location on the right side of the product.



Figure 9. KLTX Base Reflectivity product for 0612:23 EDT April 16

## 6. Buoy Data

The National Data Buoy Center (NDBC), a part of the NOAA, develops, operates, and maintains a network of buoy and C-MAN stations.

Data from the nearest buoy (41002) to the incident location were obtained from the NDBC Internet site.

Table 1 depicts standard hourly observations for 41002 during the period from 2000 EDT April 14 (0000 UTC April 15) to 1400 EDT April 16 (1800 UTC April 16).

Table 2 provides information concerning the elements of the observations. Hyperlinks to additional information are included.

<sup>3</sup> Level III data are the output of the Radar Product Generator (RPG).

**Station 41002**

**located approximately 098 degrees at 80 nautical miles from the incident location**

[http://www.ndbc.noaa.gov/station\\_history.php?station=41002](http://www.ndbc.noaa.gov/station_history.php?station=41002)

**Table 1. Station 41002 hourly observations**

YYYY	MM	DD	hh	mm	WD	WSPD	GST	WVHT	DPD	APD	MWD	BARO	ATMP	WTMP	DEWP	VIS	TIDE
2005	04	15	00	00	293	14.6	18.2	4.20	8.33	6.53	999	1003.2	18.5	21.6	14.9	99.0	99.00
2005	04	15	01	00	318	12.4	15.7	4.53	11.11	6.99	999	1002.9	19.0	21.6	13.2	99.0	99.00
2005	04	15	02	00	326	17.6	22.6	5.68	11.11	7.53	999	1004.0	16.8	21.7	13.9	99.0	99.00
2005	04	15	03	00	332	20.2	28.5	6.66	11.11	7.92	999	1003.2	16.7	21.8	14.1	99.0	99.00
2005	04	15	04	00	322	20.4	26.8	6.24	11.11	7.81	999	1003.8	15.8	21.8	12.4	99.0	99.00
2005	04	15	05	00	313	18.2	22.0	5.41	11.11	7.39	999	1004.5	16.0	21.9	12.9	99.0	99.00
2005	04	15	06	00	303	15.8	19.7	5.38	11.11	7.52	999	1004.3	16.9	21.9	14.8	99.0	99.00
2005	04	15	07	00	316	15.1	18.9	5.15	10.00	7.37	999	1004.0	18.3	22.0	15.6	99.0	99.00
2005	04	15	08	00	313	16.1	19.5	5.56	10.00	7.66	999	1004.0	18.3	22.0	15.3	99.0	99.00
2005	04	15	09	00	315	15.7	19.0	5.03	11.11	7.40	999	1004.1	18.6	21.9	15.5	99.0	99.00
2005	04	15	10	00	325	15.6	18.6	4.82	11.11	7.31	999	1004.5	19.1	21.9	15.7	99.0	99.00
2005	04	15	11	00	347	12.1	15.1	4.79	11.11	7.52	999	1005.6	17.4	21.8	15.5	99.0	99.00
2005	04	15	12	00	338	11.7	14.2	4.36	11.11	7.20	999	1006.2	17.8	21.7	16.1	99.0	99.00
2005	04	15	13	00	3	6.9	9.2	4.64	12.50	8.13	999	1006.7	18.8	21.7	15.0	99.0	99.00
2005	04	15	14	00	336	9.7	12.0	4.83	12.50	7.77	999	1007.5	18.8	21.7	15.8	99.0	99.00
2005	04	15	15	00	7	13.2	15.9	4.71	12.50	7.80	999	1008.0	19.8	21.6	14.7	99.0	99.00
2005	04	15	16	00	360	14.0	17.0	4.37	10.00	7.47	999	1008.6	19.0	21.6	15.6	99.0	99.00
2005	04	15	17	00	19	12.5	18.5	4.44	9.09	7.44	999	1009.3	18.0	21.6	16.0	99.0	99.00
2005	04	15	18	00	7	17.8	21.7	5.26	11.11	7.66	999	1009.3	18.7	21.6	14.8	99.0	99.00
2005	04	15	19	00	5	17.8	23.5	5.97	11.11	8.14	999	1009.7	18.9	21.6	14.9	99.0	99.00
2005	04	15	20	00	356	18.4	23.6	6.29	10.00	8.01	999	1009.9	17.6	21.5	15.6	99.0	99.00
2005	04	15	21	00	354	18.4	23.8	7.24	12.50	8.66	999	1010.4	17.6	21.5	15.6	99.0	99.00
2005	04	15	22	00	360	18.5	24.6	7.43	11.11	8.60	999	1011.3	17.4	21.5	15.1	99.0	99.00
2005	04	15	23	00	357	18.7	24.4	7.24	12.50	8.45	999	1011.9	17.4	21.5	15.2	99.0	99.00
2005	04	16	00	00	3	18.2	24.0	6.32	12.50	8.00	999	1012.3	17.4	21.4	15.4	99.0	99.00
2005	04	16	01	00	6	18.6	24.4	7.25	12.50	8.58	999	1012.6	18.0	21.4	14.7	99.0	99.00
2005	04	16	02	00	1	18.4	22.6	7.64	11.11	8.70	999	1013.2	17.8	21.3	14.9	99.0	99.00
2005	04	16	03	00	5	17.5	22.2	7.34	11.11	8.61	999	1013.4	17.8	21.2	14.9	99.0	99.00
2005	04	16	04	00	6	18.0	24.1	7.75	14.29	9.15	999	1013.5	17.6	21.3	15.0	99.0	99.00
2005	04	16	05	00	5	17.3	21.8	7.46	14.29	9.00	999	1013.8	17.5	21.3	15.4	99.0	99.00
2005	04	16	06	00	4	16.7	20.1	7.13	14.29	8.78	999	1013.3	18.0	21.5	15.2	99.0	99.00
2005	04	16	07	00	8	18.2	22.7	6.93	11.11	8.62	999	1012.4	18.0	21.5	15.7	99.0	99.00
2005	04	16	08	00	5	17.1	20.4	7.10	14.29	8.93	999	1012.8	18.3	21.6	15.6	99.0	99.00
2005	04	16	09	00	10	15.8	19.9	6.63	14.29	9.01	999	1013.2	18.2	21.6	15.6	99.0	99.00
2005	04	16	10	00	17	16.2	19.6	6.78	14.29	9.08	999	1013.3	18.3	21.6	15.7	99.0	99.00
2005	04	16	11	00	16	15.3	19.1	6.61	14.29	8.94	999	1013.8	18.5	21.6	15.9	99.0	99.00
2005	04	16	12	00	14	16.5	20.5	6.36	14.29	8.62	999	1014.5	18.2	21.6	16.0	99.0	99.00
2005	04	16	13	00	21	19.3	24.0	7.11	14.29	9.40	999	1014.1	17.8	21.6	16.0	99.0	99.00
2005	04	16	14	00	360	15.5	20.2	6.71	14.29	9.12	999	1015.4	17.5	21.5	16.4	99.0	99.00
2005	04	16	15	00	6	15.1	20.6	6.48	12.50	9.00	999	1015.2	17.8	21.5	16.5	99.0	99.00
2005	04	16	16	00	6	13.9	18.7	7.14	14.29	9.29	999	1015.1	18.3	21.5	16.5	99.0	99.00
2005	04	16	17	00	13	14.6	17.9	6.83	14.29	9.03	999	1015.3	18.2	21.4	17.1	99.0	99.00
2005	04	16	18	00	20	13.9	19.1	7.08	14.29	9.04	999	1015.6	18.2	21.4	17.2	99.0	99.00

**Table 2. Elements of the standard meteorological data**

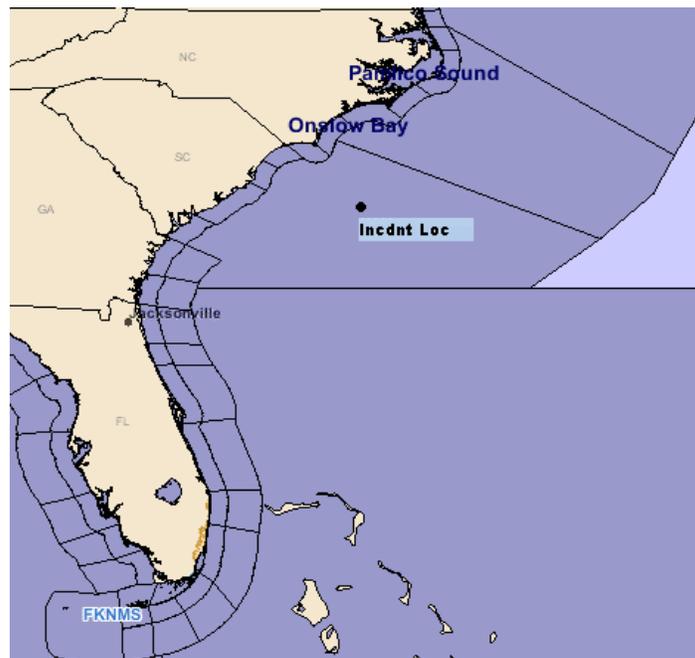
ATMP	Air temperature (Celsius). For sensor heights on buoys, see <a href="#">Hull Descriptions</a> . For sensor heights at C-MAN stations, see <a href="#">C-MAN Sensor Locations</a>
WTMP	Sea surface temperature (Celsius). For sensor depth, see <a href="#">Hull Description</a> .
DEWP	Dewpoint temperature taken at the same height as the air temperature measurement.
PRES	Sea level pressure (hPa). For C-MAN sites and Great Lakes buoys, the recorded pressure

is reduced to sea level using the method described in *NWS Technical Procedures Bulletin 291* (11/14/80).

- WSPD Wind speed (m/s) averaged over an eight-minute period for buoys and a two-minute period for land stations. Reported Hourly. See [Wind Averaging Methods](#).
- WDIR Wind direction (the direction the wind is coming from in degrees clockwise from true N) during the same period used for WSPD. See [Wind Averaging Methods](#)
- GST Peak 5 or 8 second gust speed (m/s) measured during the eight-minute or two-minute period. The 5 or 8 second period can be determined by payload, See the [Sensor Reporting, Sampling, and Accuracy](#) section.
- WVHT Significant wave height (meters) is calculated as the average of the highest one-third of all of the wave heights during the 20-minute sampling period. See the [Wave Measurements](#) section.
- APD Average wave period (seconds) of all waves during the 20-minute period. See the [Wave Measurements](#) section.
- DPD Dominant wave period (seconds) is the period with the maximum wave energy. See the [Wave Measurements](#) section.
- MWD Mean wave direction corresponding to energy of the dominant period (DOMPD). The units are degrees from true North just like wind direction. See the [Wave Measurements](#) section.
- VIS Station visibility (statute miles). Note that buoy stations are limited to reports from 0 to 1.9 miles.
- PTY Pressure Tendency is the direction (plus or minus) and the amount of pressure change (hPa) for a three hour period ending at the time of observation.
- TIDE The water level in feet above or below [Mean Lower Low Water \(MLLW\)](#).

## 6. NWS Forecasts and Advisories

The Tropical Prediction Center (TPC) in Miami, Florida, and the Ocean Prediction Center (OPC) in Washington, DC, issued Offshore Waters Forecasts for the southwestern Atlantic Ocean. Figure 10 delineates the various forecast areas.



**Figure 10. NWS Marine Forecast Areas**

Following are the Synopses and pertinent Offshore Waters Forecasts prepared by the TPC and valid during the periods beginning 1130, 1730, and 2330 April 15 and 0530 April 16:

Issuance for 1130 EDT April 15

AMZ088-152130-

SYNOPSIS FOR THE SW N ATLC INCLUDING THE BAHAMAS

1130 AM EDT FRI APR 15 2005

.SYNOPSIS...COLD FRONT FROM 31N66W TO SE BAHAMAS TO 21N77W  
WILL MOVE SE TO ALONG 27N65W TO WINDWARD PASSAGE TONIGHT...  
25N65W TO 20N71W SAT...THEN BECOME NEARLY STATIONARY FROM 23N65W  
TO 20N71W SAT NIGHT THROUGH MON. FRONT WILL NUDGE S INTO EXTREME  
SE WATERS ON TUE. STORM CENTER N OF AREA NEAR 33N73W 1000 MB  
WILL WEAKEN TO A GALE AS IT DRIFTS S AND ENTERS FORECAST WATERS  
NEAR 31N73W 1008 MB LATE TONIGHT AND SAT...THEN TO 29N74W 1012  
MB SAT NIGHT. SYSTEM WEAKENS FURTHER SUN BEFORE DISSIPATING NEAR  
28N71W. STRONG HIGH PRES WILL BUILDING W AND S OF THE GALE  
CENTER THROUGH SAT NIGHT... WITH HIGH CENTER SETTLING OVER FAR  
NW WATERS BY MON AND TUE.

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AMZ080-152130-

SW N ATLC S OF 31N W OF 65W INCLUDING THE BAHAMAS

1130 AM EDT FRI APR 15 2005

...GALE WARNING N OF 30N BETWEEN 74W AND 79W...

...GALE CONDITIONS EXPECTED SAT AND SAT NIGHT N OF 29N BETWEEN  
75W AND 79W...

.THIS AFTERNOON...N OF 29N BETWEEN 72W AND 76W WIND W TO NW 20  
TO 30 KT. SEAS 9 TO 15 FT IN N SWELL. N OF 25N W OF 76W WIND N  
20 TO 25 KT...INCREASING TO 30 KT FAR N PORTION THIS AFTERNOON.  
SEAS 9 TO 14 FT IN NE SWELL...HIGHEST N. REMAINDER AREA NW OF  
FRONT WIND W TO NW 10 TO 15 KT. SEAS 5 TO 8 FT IN N SWELL...  
EXCEPT 3 TO 4 FT S OF BAHAMAS. N OF 22N E OF FRONT WIND SW 15 TO  
20 KT. SEAS 5 TO 7 FT. S OF 22N E OF FRONT WIND SE TO S 15 KT.  
SEAS 3 TO 5 FT. WIND AND SEAS HIGHER IN SCATTERED TSTMS N OF 22N  
WITHIN 180 NM SE OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS  
N OF 27N BETWEEN 74W AND 79W.

.TONIGHT...N OF 30N BETWEEN 74W AND 79W WIND N 30 TO 40 KT. SEAS  
BUILDING TO 15 TO 21 FT. ELSEWHERE NW OF A LINE FROM 25N80W TO  
31N72W WIND NW TO N 20 TO 25 KT. SEAS BUILDING TO 10 TO 16 FT IN  
NE SWELL...HIGHEST N OF BAHAMAS. ELSEWHERE N OF 27N WIND SW TO W  
15 KT. SEAS 6 TO 9 FT IN N SWELL. ELSEWHERE S OF 27N AND NW OF  
FRONT WIND NW TO N 15 KT. SEAS 5 TO 8 FT IN N SWELL. SE OF FRONT  
WIND SE TO S 10 TO 15 KT. SEAS 3 TO 5 FT. WIND AND SEAS HIGHER  
IN SCATTERED TSTMS WITHIN 180 NM SE OF FRONT. SCATTERED SHOWERS  
AND ISOLATED TSTMS N OF 27N BETWEEN 74W AND 78W.

.SAT AND SAT NIGHT...N OF 29N BETWEEN 75W AND 79W WIND NW TO N  
30 TO 40 KT. SEAS 16 TO 22 FT. ELSEWHERE NW OF A LINE FROM  
23N79W TO 31N71W WIND NW TO N 20 TO 30 KT...HIGHEST N OF  
BAHAMAS. SEAS 10 TO 18 FT IN N SWELL. ELSEWHERE N OF 27N WIND  
SW TO W 10 TO 15 KT. SEAS 8 TO 11 FT IN N AND NE SWELL.  
ELSEWHERE S OF 27N AND NW OF FRONT WIND NW TO N 10 TO 15 KT.  
SEAS 7 TO 12 FT IN N SWELL...EXCEPT 4 TO 5 FT S OF BAHAMAS. SE

OF FRONT WIND SE TO S 10 TO 15 KT. SEAS 3 TO 5 FT. SCATTERED SHOWERS AND TSTMS WITHIN 180 NM E OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS N OF 28N BETWEEN 75W AND 79W.  
.SUN...NW OF A LINE FROM 23N79W TO 31N70W WIND BECOMING NE 20 TO 25 KT. SEAS 12 TO 18 FT IN NE SWELL...SLOWLY SUBSIDING LATE. ELSEWHERE N OF 25N WIND SW TO W 10 KT...BECOMING N AND NE LATE. SEAS 9 TO 13 FT IN N AND NE SWELL. S OF 25N WIND NE TO E 10 TO 15 KT. SEAS 6 TO 9 FT IN N SWELL. SCATTERED SHOWERS AND TSTMS ALONG FRONT. WIDELY SCATTERED SHOWERS NW OF LINE 23N79W 31N70W.  
.MON...NW OF LINE FROM 20N72W TO 29N65W WIND NE 15 TO 20 KT...EXCEPT DECREASING TO 10 TO 15 KT FAR NW PORTION. SEAS SUBSIDING TO 8 TO 10 FT. ELSEWHERE WIND NE 15 KT. SEAS 6 TO 8 FT IN N SWELL.  
.TUE...N OF 26N WIND NE 10 TO 15 KT. SEAS 5 TO 8 FT IN DECAYING NE SWELL. S OF 26N WIND NE 20 KT. SEAS 6 TO 9 FT.  
\$\$  
FORECASTER PROSISE/BROWN

### Issuance for 1730 EDT April 15

AMZ088-160330-

SYNOPSIS FOR THE SW N ATLC INCLUDING THE BAHAMAS  
530 PM EDT FRI APR 15 2005

.SYNOPSIS...COLD FRONT FROM 29N65W TO SE BAHAMAS TO 21N75W WILL MOVE SE TO ALONG 26N65W TO HAITI SAT...THEN BECOME NEARLY STATIONARY FROM 23N65W TO 20N71W SAT NIGHT THROUGH MON. FRONT WILL NUDGE S INTO EXTREME SE WATERS TUE AND WED. STORM CENTER N OF AREA NEAR 33N73W 1004 MB WILL WEAKEN TO A GALE AS IT DRIFTS S AND ENTERS FORECAST WATERS NEAR 31N72W 1008 MB LATE TONIGHT AND SAT...THEN TO 29N73W 1012 MB SAT NIGHT. SYSTEM WEAKENS FURTHER SUN BEFORE DISSIPATING NEAR 28N73W. STRONG HIGH PRES WILL BUILDING W AND S OF THE GALE CENTER THROUGH SAT NIGHT... WITH HIGH CENTER SETTTLING OVER THE NORTHERN WATERS BY LATE MON THROUGH WED.  
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AMZ080-160330-

SW N ATLC S OF 31N W OF 65W INCLUDING THE BAHAMAS  
530 PM EDT FRI APR 15 2005

...GALE WARNING N OF 29N BETWEEN 74W AND 79W...  
...GALE CONDITIONS EXPECTED SAT NIGHT N OF 29N BETWEEN 75W AND 79W...  
.TONIGHT AND SAT...N OF 29N BETWEEN 74W AND 79W WIND N 30 TO 40 KT. SEAS BUILDING TO 15 TO 20 FT. ELSEWHERE NW OF A LINE FROM 25N80W TO 31N71W WIND NW TO N 20 TO 30 KT...HIGHEST N PART. SEAS BUILDING TO 10 TO 16 FT IN NE SWELL...HIGHEST N OF BAHAMAS. ELSEWHERE N OF 27N WIND SW TO W 15 KT. SEAS 6 TO 9 FT IN N SWELL. ELSEWHERE S OF 27N AND NW OF FRONT WIND NW TO N 15 KT. SEAS BUILDING TO 6 TO 9 FT IN N SWELL...EXCEPT 4 FT S OF BAHAMAS. SE OF FRONT WIND SE TO S 10 TO 15 KT. SEAS 3 TO 5 FT. WIND AND SEAS HIGHER IN SCATTERED TSTMS WITHIN 180 NM SE OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS N OF 27N BETWEEN 74W AND 78W.

.SAT NIGHT...N OF 29N BETWEEN 75W AND 79W WIND NW TO N 30 TO 40 KT. SEAS 16 TO 22 FT. ELSEWHERE NW OF A LINE FROM 23N79W TO 31N70W WIND NW TO N 20 TO 30 KT...HIGHEST N OF BAHAMAS. SEAS 10 TO 18 FT IN N SWELL...HIGHEST N OF BAHAMAS. ELSEWHERE N OF 26N WIND SW TO W 15 KT. SEAS 8 TO 12 FT IN N AND NE SWELL. ELSEWHERE S OF 26N AND NW OF FRONT WIND NW TO N 10 TO 15 KT. SEAS 7 TO 12 FT IN N SWELL...EXCEPT 4 TO 5 FT S OF BAHAMAS. SE OF FRONT WIND SE TO S 10 TO 15 KT. SEAS 3 TO 5 FT. SCATTERED SHOWERS AND TSTMS WITHIN 180 NM E OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS N OF 28N BETWEEN 75W AND 79W.

.SUN...NW OF A LINE FROM 25N80W TO 31N69W WIND BECOMING NE 20 TO 25 KT. SEAS 12 TO 18 FT IN NE SWELL...SLOWLY SUBSIDING LATE. ELSEWHERE N OF 25N WIND SW TO W 10 TO 15 KT. SEAS 9 TO 13 FT IN N AND NE SWELL. S OF 25N WIND N TO NE 10 TO 15 KT...EXCEPT SE 10 KT FAR SE PART. SEAS 7 TO 10 FT IN N SWELL...EXCEPT 4 TO 5 FT S OF BAHAMAS. SCATTERED SHOWERS AND TSTMS ALONG FRONT.

.SUN NIGHT...N OF 24N W OF 68W WIND NE 15 TO 20 KT. SEAS 9 TO 14 FT IN NE SWELL. N OF 26N E OF 68W WIND W 15 KT. SEAS 8 TO 10 FT IN N TO NE SWELL. REMAINDER AREA WIND N TO NE 10 TO 15 KT... EXCEPT SE 10 KT FAR SE PART. SEAS 7 TO 10 FT IN N SWELL... EXCEPT 4 TO 5 FT S OF BAHAMAS. SCATTERED SHOWERS AND TSTMS ALONG FRONT.

.MON...NW OF LINE FROM 20N72W TO 26N65W WIND NE 15 TO 20 KT...EXCEPT DECREASING TO 10 TO 15 KT FAR NW PORTION. SEAS SUBSIDING TO 8 TO 10 FT. ELSEWHERE WIND BECOMING NE 15 KT. SEAS 6 TO 8 FT IN N SWELL.

.TUE...N OF 26N WIND NE 10 TO 15 KT. SEAS 5 TO 8 FT IN DECAYING NE SWELL. S OF 26N WIND NE 20 KT. SEAS 6 TO 9 FT.

.WED...N OF 26N WIND NE TO E 10 TO 15 KT. SEAS 4 TO 6 FT IN NE SWELL. S OF 26N WIND NE 15 TO 20 KT. SEAS 6 TO 8 FT.

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FORECASTER BROWN

### Issuance for 2330 EDT April 15

AMZ088-160930-

SYNOPSIS FOR THE SW N ATLC INCLUDING THE BAHAMAS  
1130 PM EDT FRI APR 15 2005

.SYNOPSIS...COLD FRONT FROM 27N65W TO 20N74W WILL MOVE SE TO ALONG A PSN FROM 26N65W TO HAITI SAT...THEN BECOME NEARLY STATIONARY FROM 23N65W TO 20N71W SAT NIGHT THROUGH MON. FRONT WILL NUDGE S INTO EXTREME SE WATERS TUE AND WED. STORM CENTER N OF AREA NEAR 33N73W 1005 MB WILL WEAKEN TO A GALE AS IT DRIFTS S AND ENTERS FORECAST WATERS NEAR 31N72W 1010 SAT...THEN TO NEAR 29N73W 1012 MB SAT NIGHT. SYSTEM WILL WEAKEN FURTHER SUN BEFORE DISSIPATING NEAR 28N73W. STRONG HIGH PRES WILL BUILD W AND S OF THE GALE CENTER THROUGH SAT NIGHT...WITH HIGH CENTER SETTTLING OVER THE NORTHERN WATERS BY LATE MON THROUGH WED.

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AMZ080-160930-

SW N ATLC S OF 31N W OF 65W INCLUDING THE BAHAMAS  
1130 PM EDT FRI APR 15 2005

...GALE WARNING N OF 29N BETWEEN 74W AND 78W...  
...GALE CONDITIONS EXPECTED SAT NIGHT N OF 29N BETWEEN 75W AND 79W...  
.TONIGHT AND SAT...N OF 29N BETWEEN 74W AND 79W WIND N 30 TO 40 KT. SEAS 15 TO 20 FT. ELSEWHERE NW OF A LINE FROM 25N80W TO 31N71W WIND NW TO N 20 TO 30 KT...HIGHEST N PART. SEAS BUILDING TO 10 TO 16 FT IN NE SWELL...HIGHEST N OF BAHAMAS. ELSEWHERE N OF 27N WIND SW TO W 15 KT. SEAS 6 TO 9 FT IN N SWELL. ELSEWHERE S OF 27N AND NW OF FRONT WIND NW TO N 15 KT. SEAS BUILDING TO 6 TO 9 FT IN N SWELL...EXCEPT 4 FT S OF BAHAMAS. SE OF FRONT WIND SE TO S 10 TO 15 KT. SEAS 3 TO 5 FT. WIND AND SEAS HIGHER IN SCATTERED TSTMS WITHIN 180 NM SE OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS N OF 27N BETWEEN 74W AND 78W.  
.SAT NIGHT...N OF 29N BETWEEN 75W AND 79W WIND NW TO N 30 TO 40 KT. SEAS 16 TO 22 FT. ELSEWHERE NW OF A LINE FROM 23N79W TO 31N70W WIND NW TO N 20 TO 30 KT...HIGHEST N OF BAHAMAS. SEAS 10 TO 18 FT IN N SWELL...HIGHEST N OF BAHAMAS. ELSEWHERE N OF 26N WIND SW TO W 15 KT. SEAS 8 TO 12 FT IN N AND NE SWELL. ELSEWHERE S OF 26N AND NW OF FRONT WIND NW TO N 10 TO 15 KT. SEAS 7 TO 12 FT IN N SWELL...EXCEPT 4 TO 5 FT S OF BAHAMAS. SE OF FRONT WIND SE TO S 10 TO 15 KT. SEAS 3 TO 5 FT. SCATTERED SHOWERS AND TSTMS WITHIN 180 NM E OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS N OF 28N BETWEEN 75W AND 79W.  
.SUN...NW OF A LINE FROM 25N80W TO 31N69W WIND BECOMING NE 20 TO 25 KT. SEAS 12 TO 18 FT IN NE SWELL...SLOWLY SUBSIDING LATE. ELSEWHERE N OF 25N WIND SW TO W 10 TO 15 KT. SEAS 9 TO 13 FT IN N AND NE SWELL. S OF 25N WIND N TO NE 10 TO 15 KT...EXCEPT SE 10 KT FAR SE PART. SEAS 7 TO 10 FT IN N SWELL...EXCEPT 4 TO 5 FT S OF BAHAMAS. SCATTERED SHOWERS AND TSTMS ALONG FRONT.  
.SUN NIGHT...N OF 24N W OF 68W WIND NE 15 TO 20 KT. SEAS 9 TO 14 FT IN NE SWELL. N OF 26N E OF 68W WIND W 15 KT. SEAS 8 TO 10 FT IN N TO NE SWELL. REMAINDER AREA WIND N TO NE 10 TO 15 KT... EXCEPT SE 10 KT FAR SE PART. SEAS 7 TO 10 FT IN N SWELL... EXCEPT 4 TO 5 FT S OF BAHAMAS. SCATTERED SHOWERS AND TSTMS ALONG FRONT.  
.MON...NW OF LINE FROM 20N72W TO 26N65W WIND NE 15 TO 20 KT ...EXCEPT DECREASING TO 10 TO 15 KT FAR NW PORTION. SEAS SUBSIDING TO 8 TO 10 FT. ELSEWHERE WIND BECOMING NE 15 KT. SEAS 6 TO 8 FT IN N SWELL.  
.TUE...N OF 26N WIND NE 10 TO 15 KT. SEAS 5 TO 8 FT IN DECAYING NE SWELL. S OF 26N WIND NE 20 KT. SEAS 6 TO 9 FT.  
.WED...N OF 26N WIND NE TO E 10 TO 15 KT. SEAS 4 TO 6 FT IN NE SWELL. S OF 26N WIND NE 15 TO 20 KT. SEAS 6 TO 8 FT.  
\$\$

### Issuance for 0530 EDT April 16

AMZ088-161530-

SYNOPSIS FOR THE SW N ATLC INCLUDING THE BAHAMAS  
530 AM EDT SAT APR 16 2005

.SYNOPSIS...COLD FRONT FROM 26N65W TO 20N74W WILL MOVE SE TO ALONG A PSN FROM 25N65W TO 20N72W THIS AFTERNOON...THEN BECOME NEARLY STATIONARY FROM 23N65W TO 20N71W TONIGHT THROUGH SUN

NIGHT. FRONT WILL RESUME SE MOVEMENT INTO EXTREME SE WATERS MON THEN MOVE E OF AREA TUE. LOW NEAR 31N72W 1007 MB WILL DRIFT S TO NEAR 30N72W 1012 MB TONIGHT...THEN WEAKEN BELOW GALE SUN AS IT MOVES E NEAR 30N70W LATE SUN...30N68W SUN NIGHT...THEN BECOME DIFFUSE MON. STRONG HIGH PRES WILL BUILD W AND S OF THE GALE CENTER THROUGH TONIGHT...WITH HIGH CENTER SETTling OVER THE NORTHERN WATERS LATE MON THROUGH WED.

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AMZ080-161530-

SW N ATLC S OF 31N W OF 65W INCLUDING THE BAHAMAS  
530 AM EDT SAT APR 16 2005

...GALE WARNING N OF 29N BETWEEN 74W AND 79W...

.TODAY...N OF 29N BETWEEN 74W AND 79W WIND N 30 TO 40 KT. SEAS 16 TO 22 FT. ELSEWHERE NW OF A LINE FROM 25N80W TO 31N71W WIND NW TO N 20 TO 30 KT...HIGHEST N PART. SEAS 10 TO 18 FT IN NE SWELL...HIGHEST N OF BAHAMAS. ELSEWHERE N OF 27N WIND SW TO W 15 TO 20 KT. SEAS 9 TO 13 FT IN N SWELL. ELSEWHERE S OF 27N AND NW OF FRONT WIND NW TO N 15 KT. SEAS BUILDING TO 6 TO 10 FT IN N SWELL...EXCEPT 4 FT S OF BAHAMAS. SE OF FRONT WIND SE TO S 10 TO 15 KT. SEAS 3 TO 5 FT. WIND AND SEAS HIGHER IN SCATTERED TSTMS WITHIN 180 NM SE OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS N OF 30N BETWEEN 74W AND 78W.

.TONIGHT...N OF 29N BETWEEN 75W AND 79W WIND NW TO N 30 TO 35 KT. SEAS 16 TO 21 FT. ELSEWHERE NW OF A LINE FROM 23N79W TO 31N70W WIND NW TO N 20 TO 30 KT...HIGHEST N OF BAHAMAS. SEAS 10 TO 18 FT IN N SWELL...HIGHEST N OF BAHAMAS. ELSEWHERE N OF 26N WIND SW TO W 15 TO 20 KT. SEAS 9 TO 13 FT IN N AND NE SWELL. ELSEWHERE S OF 26N AND NW OF FRONT WIND N TO NE 10 TO 15 KT. SEAS 7 TO 12 FT IN N SWELL...EXCEPT 4 TO 6 FT S OF BAHAMAS. SE OF FRONT WIND E TO SE 10 TO 15 KT. SEAS 3 TO 5 FT. SCATTERED SHOWERS AND TSTMS WITHIN 180 NM E OF FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS N OF 28N BETWEEN 75W AND 79W.

.SUN...NW OF A LINE FROM 25N80W TO 31N71W WIND BECOMING NE 20 TO 25 KT. SEAS 12 TO 18 FT IN NE SWELL...HIGHEST N OF 28N. ELSEWHERE N OF 26N WIND SW TO W 10 TO 15 KT. SEAS 9 TO 13 FT IN NE SWELL. S OF 26N WIND N TO NE 10 TO 15 KT...EXCEPT SE 10 KT FAR SE PART. SEAS 7 TO 12 FT IN N SWELL...EXCEPT 4 TO 6 FT S OF BAHAMAS. SCATTERED SHOWERS AND TSTMS ALONG FRONT. SCATTERED SHOWERS AND ISOLATED TSTMS FROM 26N TO 28N W OF 75W.

.SUN NIGHT...NW OF A LINE FROM 24N80W TO 31N69W WIND NE 15 TO 20 KT. SEAS SUBSIDING TO 9 TO 14 FT IN NE SWELL. ELSEWHERE N OF 26N WIND SW TO W 10 KT. SEAS 8 TO 11 FT IN NE SWELL. S OF 26N WIND N TO NE 10 TO 15 KT...EXCEPT SE TO S 10 KT FAR SE PART. SEAS 7 TO 11 FT IN N SWELL...EXCEPT 4 TO 6 FT S OF BAHAMAS. SCATTERED SHOWERS AND TSTMS ALONG FRONT. SCATTERED SHOWERS N OF 29N E OF 75W...AND S OF 27N W OF 76W.

.MON...NW OF LINE FROM 20N72W TO 31N65W WIND NE 15 TO 20 KT... EXCEPT DECREASING TO 10 TO 15 KT FAR NW PORTION LATE. SEAS 8 TO 11 FT IN NE SWELL. ELSEWHERE WIND BECOMING N TO NE 15 KT. SEAS 6 TO 8 FT IN N SWELL.

.TUE...N OF LINE 26N80W 28N65W WIND NE TO E 10 TO 15 KT. SEAS 5 TO 8 FT IN DECAYING NE SWELL. S OF LINE 26N80W 28N65W WIND NE 15 TO 20 KT...EXCEPT 10 TO 15 KT FAR SE PORTION. SEAS 6 TO 8 FT.

SCATTERED TSTMS SE PORTION.

.WED...N OF 27N WIND NE TO E 10 TO 15 KT. SEAS 4 TO 6 FT. S OF  
27N WIND NE 15 TO 20 KT...EXCEPT 10 TO 15 KT FAR SE PORTION.  
SEAS 6 TO 8 FT.

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FORECASTER MOLLEDA

Following are the Synopses and pertinent Offshore Waters Forecasts prepared by the OPC  
and valid during the periods beginning 1030, 1600, and 2230 April 15 and 0330 April 16:

Issuance for 1030 EDT April 15

FZNT22 KWBC 151418

2005105 1419

OFFNT2

OFFSHORE WATERS FORECAST

NATIONAL WEATHER SERVICE WASHINGTON DC

OCEAN PREDICTION CENTER/OCEAN FORECAST BRANCH

1030 AM EDT FRI 15 APR 2005

W CENTRAL N ATLC CONTINENTAL SHELF AND SLOPE WATERS BEYOND 20 NM  
TO 250 NM OFFSHORE...INCLUDING S OF GEORGES BANK FROM 1000 FMS  
TO 250 NM OFFSHORE

ANZ089-152030-

.SYNOPSIS...LOW PRES CENTERED ABOUT 180 NM SE OF CAPE HATTERAS  
WILL DRIFT S THROUGH SAT NIGHT...WHEN IT PASSES S OF THE AREA. A  
STRONG HIGH PRES RIDGE N OF THE WATERS WILL DRIFT S AND SLOWLY  
WEAKEN THROUGH SUN. A WEAK COLD FRONT WILL PASS SE ACROSS THE  
NORTHERN WATERS LATE SUN THROUGH MON. THE HIGH WILL BUILD E  
ACROSS THE WATERS LATE MON THROUGH TUE.

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ANZ088-152030-

CAPE FEAR TO 31N OUT TO 32N 73W TO 31N 74W.

1030 AM EDT FRI 15 APR 2005

...STORM WARNING...

...W WALL OF GULF STREAM NEAR 31.0N 80.0W...32N 78.6W...33.3N  
76.9W...

.THIS AFTERNOON...N TO NW WINDS 35 TO 45 KT...EXCEPT TO 55 KT IN  
GULF STREAM. SEAS 10 TO 18 FT BUILDING TO 12 TO 22 FT...HIGHEST  
FROM THE GULF STREAM E. RAIN AND SCATTERED TSTMS. VSBY  
OCCASIONALLY BELOW 1 NM.

.TONIGHT...N TO NW WINDS DECREASING TO 30 TO 40 KT...EXCEPT TO  
45 KT IN GULF STREAM. SEAS 12 TO 22 FT...HIGHEST FROM THE GULF  
STREAM E. RAIN AND SCATTERED TSTMS. VSBY OCCASIONALLY BELOW 1  
NM. .SAT...N TO NE WINDS DECREASING TO 25 TO 35 KT...EXCEPT TO  
40 KT IN GULF STREAM. SEAS BECOMING 10 TO 22 FT...HIGHEST FROM  
THE GULF STREAM E...EXCEPT SUBSIDING TO 7 TO 10 FT W OF GULF  
STREAM. RAIN AND SCATTERED TSTMS. VSBY OCCASIONALLY BELOW 1 NM.

.SAT NIGHT...N TO NE WINDS 25 TO 35 KT. SEAS BECOMING 9 TO 18 FT  
THROUGHOUT...EXCEPT TO 21 FT IN GULF STREAM. RAIN ENDING.

.SUN...NE WINDS 20 TO 30 KT EARLY...THEN DECREASING TO 10 TO 15  
KT LATE. SEAS SUBSIDING TO 7 TO 14 FT LATE. HIGHEST WINDS AND  
SEAS SE.

.MON...WINDS BECOMING VARIABLE 5 TO 10 KT LATE. SEAS SUBSIDING

TO 5 TO 8 FT...HIGHEST S.  
.TUE...VARIABLE WINDS 5 TO 10 KT. SEAS SUBSIDING TO 3 TO 5 FT.  
\$\$  
.FORECASTER SCOVIL. OCEAN FORECAST BRANCH.

Issuance for 1600 EDT April 15

FZNT22 KWBC 151938 2005105 1939  
OFFNT2

OFFSHORE WATERS FORECAST  
NATIONAL WEATHER SERVICE WASHINGTON DC  
OCEAN PREDICTION CENTER/OCEAN FORECAST BRANCH  
400 PM EDT FRI 15 APR 2005

W CENTRAL N ATLC CONTINENTAL SHELF AND SLOPE WATERS BEYOND 20 NM  
TO 250 NM OFFSHORE...INCLUDING S OF GEORGES BANK FROM 1000 FMS  
TO 250 NM OFFSHORE  
ANZ089-160230-

.SYNOPSIS...LOW PRES CENTERED ABOUT 200 NM SE OF CAPE HATTERAS  
WILL DRIFT SOUTH SE THROUGH SAT NIGHT. A STRONG HIGH PRES RIDGE  
N OF THE WATERS WILL MOVE S SW AND SLOWLY WEAKEN THROUGH SUN. A  
WEAK COLD FRONT WILL PASS SE ACROSS THE NORTHERN WATERS LATE SUN  
THROUGH MON. THE HIGH WILL BUILD E ACROSS THE AREA LATE MON  
THROUGH TUE. ANOTHER COLD FRONT WILL MOVE E OVER THE NORTHERN  
WATERS ON WED.  
\$\$

ANZ088-160230-  
CAPE FEAR TO 31N OUT TO 32N 73W TO 31N 74W.  
400 PM EDT FRI 15 APR 2005

...GALE WARNING...  
...W WALL OF GULF STREAM NEAR 31.0N 80.0W...32N 78.6W...33.3N  
76.9W...  
.TONIGHT...N TO NW WINDS 35 TO 45 KT DECREASING TO 30 TO 40  
KT...HIGHEST IN GULF STREAM. SEAS 12 TO 22 FT...HIGHEST FROM THE  
GULF STREAM E. RAIN AND SCATTERED TSTMS. VSBY OCCASIONALLY BELOW  
1 NM.  
.SAT...N TO NE WINDS DECREASING TO 25 TO 35 KT...EXCEPT TO 40 KT  
IN GULF STREAM. SEAS BECOMING 10 TO 22 FT...HIGHEST FROM THE  
GULF STREAM E...EXCEPT SUBSIDING TO 7 TO 10 FT W OF GULF STREAM.  
RAIN AND SCATTERED TSTMS. VSBY OCCASIONALLY BELOW 1 NM.  
.SAT NIGHT...N TO NE WINDS 25 TO 35 KT. SEAS BECOMING 9 TO 18 FT  
THROUGHOUT...EXCEPT TO 21 FT IN GULF STREAM. RAIN ENDING.  
.SUN...NE WINDS 20 TO 30 KT EARLY...THEN DECREASING TO 10 TO 15  
KT LATE. SEAS SUBSIDING TO 7 TO 14 FT LATE. HIGHEST WINDS AND  
SEAS SE.  
.SUN NIGHT...NE TO N WINDS 10 TO 15 KT. SEAS SUBSIDING TO 6 TO  
10 FT...HIGHEST SE.  
.MON...WINDS BECOMING VARIABLE 5 TO 10 KT LATE. SEAS SUBSIDING  
TO 5 TO 7 FT.  
.TUE...VARIABLE WINDS 5 TO 10 KT. SEAS SUBSIDING TO 3 TO 5 FT.  
.WED...VARIABLE WINDS 5 TO 10 KT BECOMING W TO SW 10 KT LATE.  
SEAS 2 TO 4 FT.  
\$\$

.FORECASTER SCOVIL. OCEAN FORECAST BRANCH.

Issuance for 2230 EDT April 15

FZNT22 KWBC 160211 2005106 0211  
OFFNT2  
OFFSHORE WATERS FORECAST  
NATIONAL WEATHER SERVICE WASHINGTON DC  
OCEAN PREDICTION CENTER/OCEAN FORECAST BRANCH  
1030 PM EDT FRI 15 APR 2005  
W CENTRAL N ATLC CONTINENTAL SHELF AND SLOPE WATERS BEYOND 20 NM  
TO 250 NM OFFSHORE...INCLUDING S OF GEORGES BANK FROM 1000 FMS  
TO 250 NM OFFSHORE  
ANZ089-160830-  
.SYNOPSIS...DEEP LOW PRES CENTERED ABOUT 250 NM SE OF CAPE FEAR  
WILL DRIFT SOUTH SE THROUGH SAT NIGHT. A STRONG HIGH PRES RIDGE  
N OF THE WATERS WILL MOVE S SW AND GRADUALLY WEAKEN THROUGH SUN.  
A WEAK COLD FRONT WILL PASS SE ACROSS THE NORTHERN WATERS LATE  
SUN THROUGH MON. THE HIGH WILL BUILD E ACROSS THE AREA LATE MON  
THROUGH TUE. ANOTHER COLD FRONT WILL APPROACH THE N WATERS ON  
WED.  
\$\$

ANZ088-160830-  
CAPE FEAR TO 31N OUT TO 32N 73W TO 31N 74W.  
1030 PM EDT FRI 15 APR 2005  
...GALE WARNING...  
...W WALL OF GULF STREAM NEAR 31.0N 80.0W...32N 78.6W...33.3N  
76.9W...  
.OVERNIGHT...N TO NW WINDS 35 TO 45 KT DECREASING TO 30 TO 40  
KT...HIGHEST IN GULF STREAM. SEAS 12 TO 22 FT...HIGHEST FROM THE  
GULF STREAM E. RAIN AND SCATTERED TSTMS. VSBY OCCASIONALLY BELOW  
1 NM.  
.SAT...N TO NE WINDS DECREASING TO 25 TO 35 KT...EXCEPT TO 40 KT  
IN GULF STREAM. SEAS BECOMING 10 TO 22 FT...HIGHEST FROM THE  
GULF STREAM E...EXCEPT SUBSIDING TO 7 TO 10 FT W OF GULF STREAM.  
RAIN AND SCATTERED TSTMS. VSBY OCCASIONALLY BELOW 1 NM.  
.SAT NIGHT...N TO NE WINDS 25 TO 35 KT. SEAS BECOMING 9 TO 18 FT  
THROUGHOUT...EXCEPT TO 21 FT IN GULF STREAM. RAIN ENDING.  
.SUN...NE WINDS 20 TO 30 KT EARLY...THEN DECREASING TO 10 TO 15  
KT LATE. SEAS SUBSIDING TO 7 TO 14 FT LATE. HIGHEST WINDS AND  
SEAS SE.  
.SUN NIGHT...NE TO N WINDS 10 TO 15 KT. SEAS SUBSIDING TO 6 TO  
10 FT...HIGHEST SE.  
.MON...WINDS BECOMING VARIABLE 5 TO 10 KT LATE. SEAS SUBSIDING  
TO 5 TO 7 FT.  
.TUE...VARIABLE WINDS 5 TO 10 KT. SEAS SUBSIDING TO 3 TO 5 FT.  
.WED...VARIABLE WINDS 5 TO 10 KT BECOMING SW 10 KT LATE. SEAS 2  
TO 4 FT.  
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Issuance for 0330 EDT April 16

FZNT22 KWBC 160734

2005106 0734

OFFNT2

OFFSHORE WATERS FORECAST

NATIONAL WEATHER SERVICE WASHINGTON DC

OCEAN PREDICTION CENTER/OCEAN FORECAST BRANCH

330 AM EDT SAT 16 APR 2005

W CENTRAL N ATLC CONTINENTAL SHELF AND SLOPE WATERS BEYOND 20 NM  
TO 250 NM OFFSHORE...INCLUDING S OF GEORGES BANK FROM 1000 FMS  
TO 250 NM OFFSHORE

ANZ089-161430-

.SYNOPSIS...DEEP LOW PRES ABOUT 250 NM SE OF CAPE FEAR WILL  
DRIFT SOUTH SE THROUGH TONIGHT. A STRONG HIGH PRES RIDGE N OF  
THE WATERS WILL MOVE S SW AND GRADUALLY WEAKEN THROUGH SUN. A  
WEAK COLD FRONT WILL PASS SE ACROSS THE NORTHERN WATERS LATE SUN  
THROUGH MON. THE HIGH WILL BUILD E ACROSS THE AREA LATE MON  
THROUGH TUE. ANOTHER COLD FRONT WILL APPROACH THE N WATERS ON  
WED.

\$\$

ANZ088-161430-

CAPE FEAR TO 31N OUT TO 32N 73W TO 31N 74W.

330 AM EDT SAT 16 APR 2005

...GALE WARNING...

...W WALL OF GULF STREAM NEAR 31.0N 80.0W...32N 78.6W...33.3N  
76.9W...

.TODAY...N TO NE WINDS 35 TO 45 KT DECREASING TO 30 TO 40 KT  
THIS AFTERNOON...HIGHEST IN GULF STREAM. SEAS 10 TO 24 FT.  
HIGHEST WINDS AND SEAS NE. AREAS OF RAIN AND FOG. VSBY  
OCCASIONALLY BELOW 1 NM.

.TONIGHT...N TO NE WINDS 25 TO 35 KT. SEAS BECOMING 9 TO 18 FT  
THROUGHOUT...EXCEPT TO 21 FT IN GULF STREAM. RAIN ENDING AND  
VSBY IMPROVING.

.SUN...NE WINDS DECREASING TO 20 TO 30 KT EARLY...THEN BECOMING  
10 TO 15 KT LATE. SEAS SUBSIDING TO 7 TO 14 FT LATE. HIGHEST  
WINDS AND SEAS SE.

.SUN NIGHT...NE TO N WINDS 10 TO 15 KT. SEAS SUBSIDING TO 6 TO  
10 FT...HIGHEST SE.

.MON...WINDS BECOMING VARIABLE 5 TO 10 KT LATE. SEAS SUBSIDING  
TO 5 TO 7 FT.

.TUE...VARIABLE WINDS 5 TO 10 KT. SEAS SUBSIDING TO 2 TO 5  
FT...HIGHEST E.

.WED...VARIABLE WINDS 5 TO 10 KT BECOMING SW 10 KT LATE. SEAS 2  
TO 3 FT.

\$\$

.FORECASTER SCHOENBERG. OCEAN FORECAST BRANCH.

## 7. Wind/Wave Analysis Charts

Wind/Wave Analysis charts prepared by the OPC for 0800, 1100, 1700, 2000, and 2300 April 15 and 0500 and 0800 April 16 were obtained from the OPC Internet site and are shown in figures 11, 12, 13, 14, 15, 16, and 17, respectively. Note: Charts for 1400 April 15 and 0200 April 16 were not available. The approximate incident location is annotated by •.

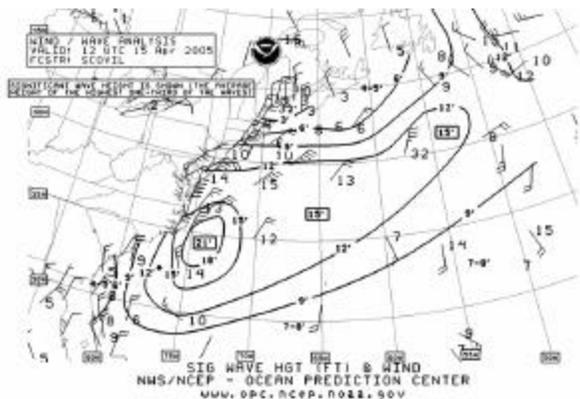


Figure 11. Wind/Wave Analysis chart for 0800 EDT April 15

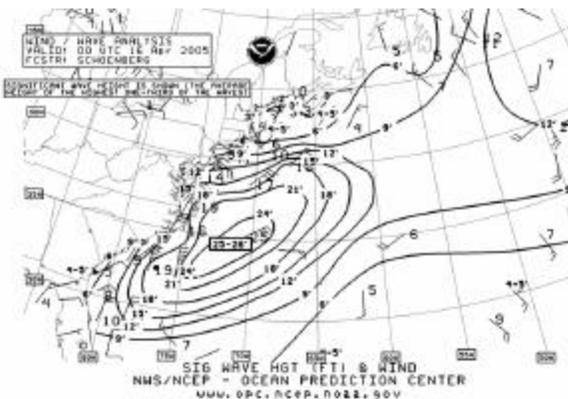


Figure 14. Wind/Wave Analysis chart for 2000 EDT April 15

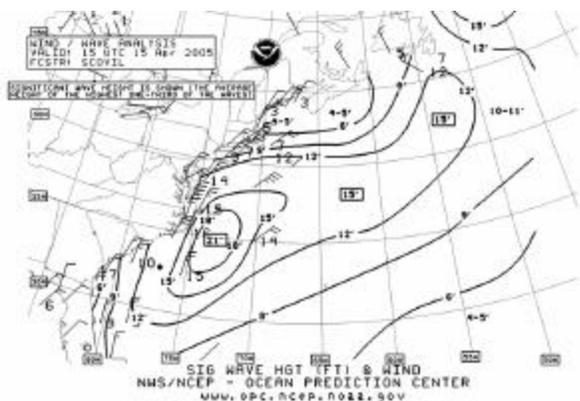


Figure 12. Wind/Wave Analysis chart for 1100 EDT April 15

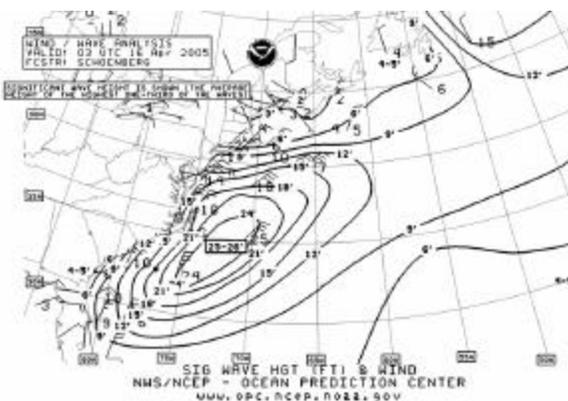


Figure 15. Wind/Wave Analysis chart for 2300 EDT April 15

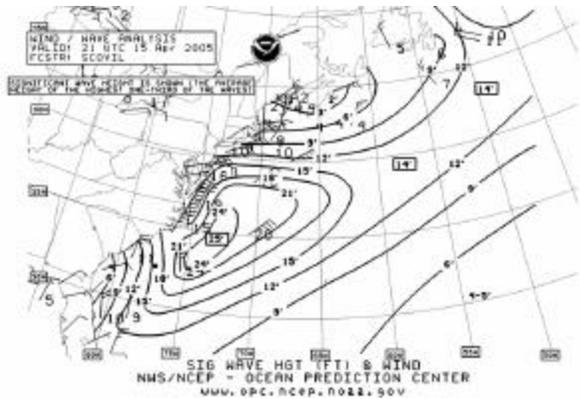


Figure 13. Wind/Wave Analysis chart for 1700 EDT April 15

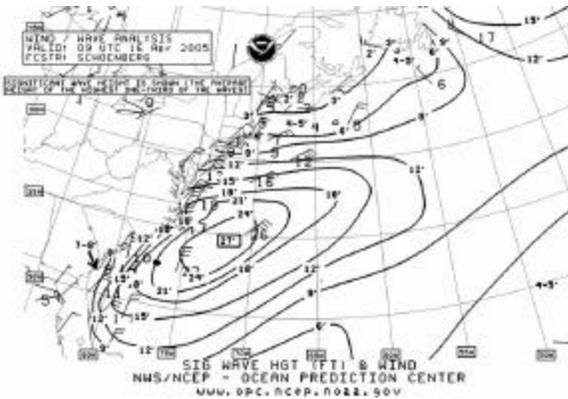


Figure 16. Wind/Wave Analysis chart for 0500 EDT April 16

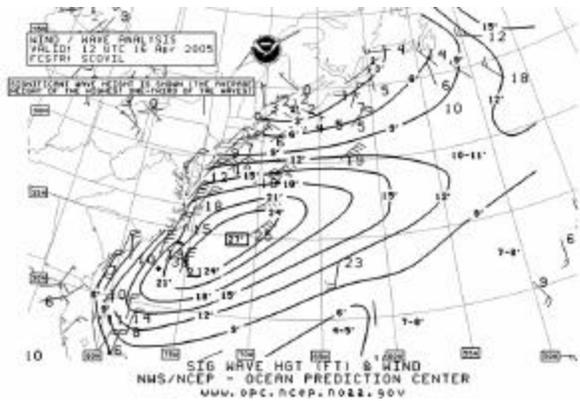


Figure 17. Wind/Wave Analysis chart for 0800 EDT April 16

### 8. 24-Hour Wind and Wave Forecast Charts

The 24-hour Wind and Wave Forecast charts prepared by the OPC and issued at 0800 and 2000 April 14 and 0800 April 15 are shown in figures 18, 19, and 20. Notes: The charts were obtained from the OPC Internet site and from the NCDC. The approximate incident location is annotated by •.

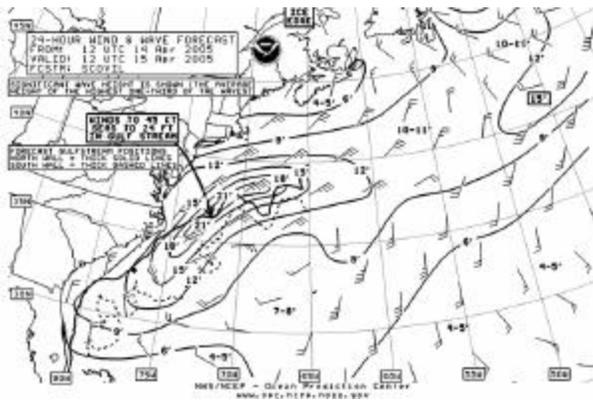


Figure 18. 24-hour Wind and Wave Forecast chart issued 0800 EDT April 14

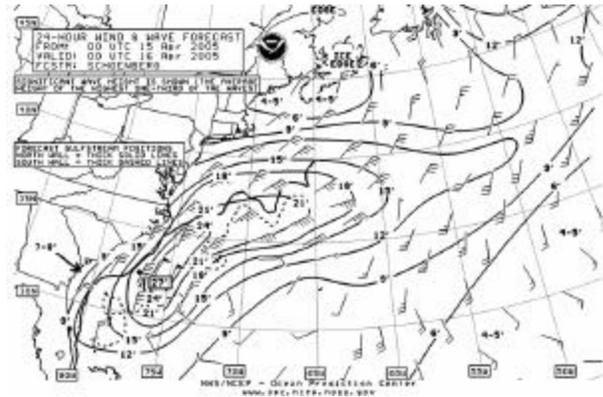


Figure 19. 24-hour Wind and Wave Forecast chart issued 2000 EDT April 14

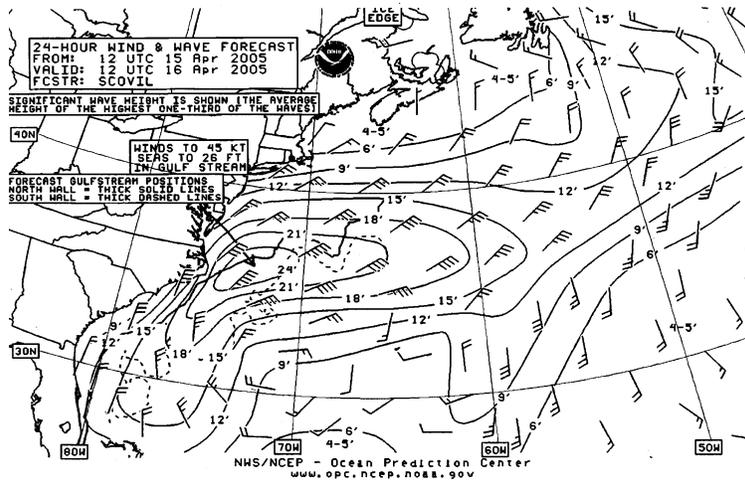


Figure 20. 24-hour Wind and Wave Forecast chart issued 0800 EDT April 15

9. 48-Hour Wind and Wave Forecast Charts

The 48-hour Wind and Wave Forecast charts prepared by the OPC and issued at 0800 and 2000 April 14 and 0800 and 2000 April 15 are shown in figures 21, 22, 23, and 24. Notes: The charts were obtained from the NCDC. The wave forecast height is in meters.

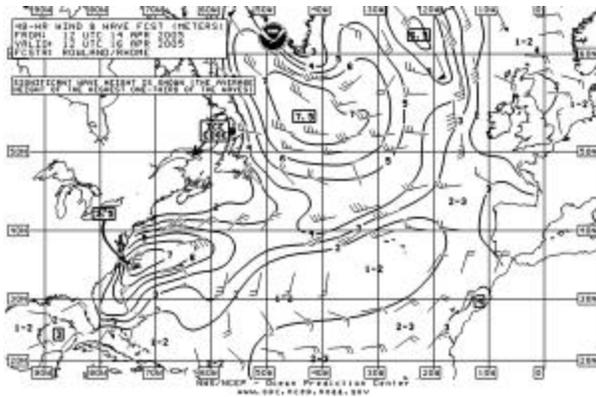


Figure 21. 48-hour Wind and Wave Forecast chart issued 0800 EDT April 14

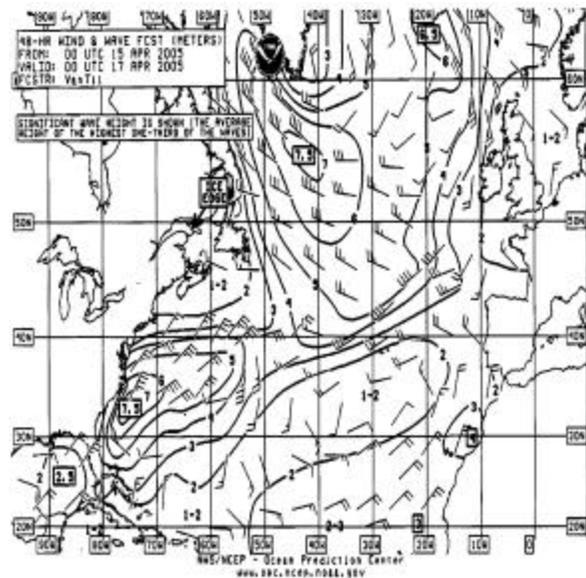


Figure 22. 48-hour Wind and Wave Forecast chart issued 2000 EDT April 14

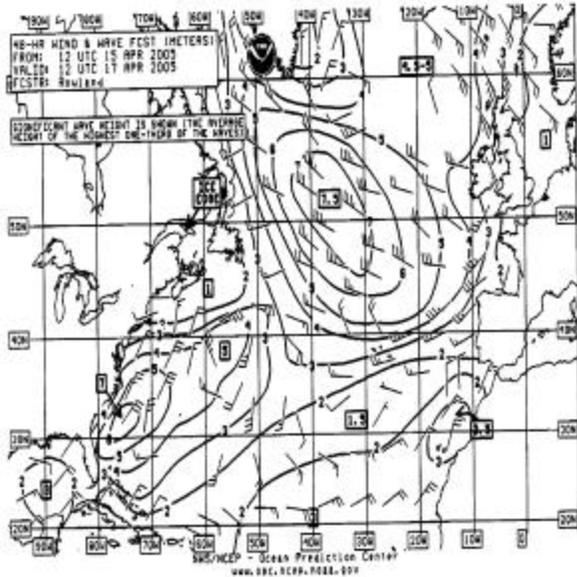


Figure 23. 48-hour Wind and Wave Forecast chart issued 0800 EDT April 15

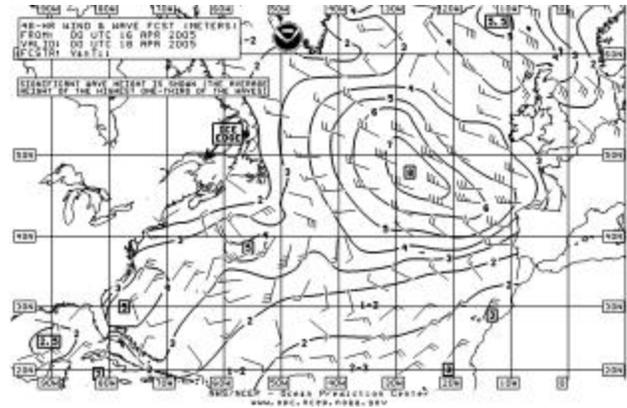


Figure 24. 48-hour Wind and Wave Forecast chart issued 2000 EDT April 15

## 10. Ship Reports

Ship and buoy data for April 16 were retrieved from the McIDAS database. Interrogation of the data revealed only data from the vessel identified as A8EX in the region of the incident.

Table 3 shows the ship report data for A8EX. Following are the units in the table: time (UTC), latitude (degrees north), longitude (degrees west), wind direction (true), wind speed (knots), SWH-height of sea (feet), PSD-direction of swell (true).

Table 3. A8EX ship reports for April 16

IDA	TIME[HMS]	LAT[DEG]	LON[DEG]	DIR[DEG]	SPD[KT]	SWH[FT]	PSD[DEG]
A8EX	60000	33.0000	74.6000	20	33.0	4.9	20
A8EX	60000	33.0000	74.6000	20	33.0	31.2	20
A8EX	180000	35.1000	75.0000	10	38.9	0.0	10
A8EX	180000	35.1000	75.0000	10	38.9	19.7	10

## 10. Astronomical Data

Sunrise data for the incident location for April 16 were determined using the U.S. Naval Observatory's online calculator and follow below:

*U.S. Naval Observatory  
Astronomical Applications Department*

### Sun and Moon Data for One Day

The following information is provided for Norwegian Dawn (longitude W77.0, latitude N32.5):

Saturday

16 April 2005

Universal Time - 4h

#### **SUN**

Begin civil twilight	06:12
Sunrise	06:37
Sun transit	13:08
Sunset	19:38
End civil twilight	20:04

#### **MOON**

Moonrise	11:23 on preceding day
Moonset	02:26
Moonrise	12:20
Moon transit	19:46
Moonset	03:06 on following day

First quarter Moon on 16 April 2005 at 10:37 (Universal Time - 4h).

James T. Skeen, Jr.  
Senior Meteorologist